**WATER RESOURCES RESEARCH GRANT PROPOSAL**

**Project ID:** 2005CA129B

**Title:** California-2100: Assessing Future Water Resources over California

**Project Type:** Research

**Focus Categories:** Climatological Processes, Hydrology

**Keywords:** None

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**Federal Funds:** $7,500

**Non-Federal Matching Funds:** $22,451

**Congressional District:** 44

**Principal Investigator:**
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## Abstract

This project will implement an initial phase of California-2100 (Cal21), which is aimed at making and evaluating high resolution estimates of climate change over California out to the year 2100. Emphasis in this initial WRC component of this project will be given to evaluating how well regional climate models reproduce the interannual variations of important components of the water budget for California, utilizing both observations and global climate model (GCM) output as the regional model input.

The overall goals of Cal21 are to provide:
1. Assessments of the quality of global climate models in recreating recent past climates. The comparison data will be primarily the global NCEP Global Reanalysis (NGR) and long-term satellite data sets. Included will be a careful determination of the biases in the climate models relative to observations. These assessments will serve as one measure of the likely quality of forecasts by these models of future climates.
2. Comparisons for recent past climates of the ability of various regional models to transform lower resolution global observational analyses and global climate model output (with possible bias adjustments) to higher resolution regional scale output. The comparison data will be the NCEP Regional Reanalysis (NRR) observations and other high quality regional scale gridded data sets. These comparisons will assess by the ability

of the climate models, which necessarily have biases and other errors with respect to the global reanalyses, to reproduce high resolution observations of recent climate.
3. Production of high resolution forecasts of future California climates, which have objective measures of uncertainty and confidence based upon the output of the best available GCMs and the best quality regional model downscaling.

This WRC proposal is designed to demonstrate the utility of a major component of Cal21 by showing that regional scale climate models can be used to accurately downscale temperature, precipitation and evaporation from course grid observational analyses and climate model output to higher resolution output. Emphasis will be given to analyzing those variables which are important for future water management in California. An important product of this work will be statewide high resolution maps of major climatic variables along with objective assessments of the uncertainties.